

APPARATUS METHODS AND COMPUTER READABLE STORAGE MEDIUMS

FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate to apparatus, methods and computer readable storage mediums. In particular, they relate to apparatus, methods and computer readable storage mediums in a mobile cellular telephone.

BACKGROUND TO THE INVENTION

[0002] Apparatus, such as mobile cellular telephones, may comprise a camera module having an image sensor array (for example, a charge coupled device camera or a complementary metal-oxide semiconductor camera) that enables a user to take photographs. If the ambient light intensity is relatively low, an additional source of light, such as a flash unit, may be required in order to obtain a photograph with acceptable brightness levels.

[0003] However, apparatus such as mobile cellular telephones usually comprise other electronic components that may require a relatively high current from an electrical energy storage device (such as a battery) of the apparatus. Since the flash unit may also require a relatively large current from the electrical energy storage device to operate, the electrical energy storage device may be unable to provide a sufficiently high current to both the flash unit and the other electronic component. If the image sensor array operates with a 'rolling shutter', a photograph obtained by the image sensor array may include artifacts (variations in brightness down the photograph for example) if the flash unit is disabled due to low current during exposure.

[0004] Therefore, it would be desirable to provide an alternative apparatus.

BRIEF DESCRIPTION OF VARIOUS EMBODIMENTS OF THE INVENTION

[0005] According to various, but not necessarily all, embodiments of the invention there is provided an apparatus comprising: a processor configured to control a flash unit in an exposure time period of an image sensor array, to provide a first non-zero light intensity in a first portion of the exposure time period and to provide a second non-zero light intensity, different to the first light intensity, in a second portion of the exposure time period.

[0006] The apparatus may be for wireless communications.

[0007] The processor may be configured to control the flash unit to provide the first non-zero light intensity in a plurality of portions of the exposure time period and to provide the second non-zero light intensity in a plurality of different portions of the exposure time period.

[0008] The first non-zero light intensity may be higher in intensity than the second non-zero light intensity.

[0009] An electrical energy storage device may be configured to provide a maximum output during the first portion of the exposure time period.

[0010] The processor may be configured to receive information indicative that another electronic component requires electrical energy and control the flash unit using the received information.

[0011] The received information may be indicative of radio frequency transmission and the processor may be configured to control the flash unit to provide the first non-zero light intensity during periods of time of non radio frequency trans-

mission and to provide the second non-zero light intensity during periods of time of radio frequency transmission.

[0012] According to various, but not necessarily all, embodiments of the invention there is provided a device comprising an apparatus as described in any of the preceding paragraphs.

[0013] According to various, but not necessarily all, embodiments of the invention there is provided a mobile cellular telephone comprising an apparatus as described in any of the preceding paragraphs.

[0014] According to various, but not necessarily all, embodiments of the invention there is provided a method comprising: controlling a flash unit in an exposure time period of an image sensor array, to provide a first non-zero light intensity in a first portion of the exposure time period and to provide a second non-zero light intensity, different to the first light intensity, in a second portion of the exposure time period.

[0015] The method may further comprise controlling the flash unit to provide the first non-zero light intensity in a plurality of portions of the exposure time period and to provide the second non-zero light intensity in a plurality of different portions of the exposure time period.

[0016] The first non-zero light intensity may be higher in intensity than the second non-zero light intensity.

[0017] An electrical energy storage device may be configured to provide a maximum output during the first portion of the exposure time period.

[0018] The method may further comprise receiving information indicative that another electronic component requires electrical energy and controlling the flash unit using the received information.

[0019] The received information may be indicative of radio frequency transmission. The method may further comprise controlling the flash unit to provide the first non-zero light intensity during periods of time of non radio frequency transmission and to provide the second non-zero light intensity during periods of time of radio frequency transmission.

[0020] According to various, but not necessarily all, embodiments of the invention there is provided a computer readable storage medium encoded with instructions that, when executed by a processor, perform: controlling a flash unit in an exposure time period of an image sensor array, to provide a first non-zero light intensity in a first portion of the exposure time period and to provide a second non-zero light intensity, different to the first light intensity, in a second portion of the exposure time period.

[0021] The computer readable storage medium may be encoded with instructions that, when executed by a processor, perform controlling the flash unit to provide the first non-zero light intensity in a plurality of portions of the exposure time period and to provide the second non-zero light intensity in a plurality of different portions of the exposure time period.

[0022] The first non-zero light intensity may be higher in intensity than the second non-zero light intensity.

[0023] An electrical energy storage device may be configured to provide a maximum output during the first portion of the exposure time period.

[0024] The computer readable storage medium may be encoded with instructions that, when executed by a processor, perform receiving information indicative that another electronic component requires electrical energy and controlling the flash unit using the received information.